3D SEISMIC AND RESERVOIR MODELING, RAM PROSPECT, VIOSCA KNOLL BLOCK 912, OFFSHORE GULF OF MEXICO

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ABSTRACT

Ram prospect is a large stratigraphic trap located in Viosca Knoll Blocks 912/956/957 offshore Alabama in 3500' water depth. Reservoirs are Pliocene and Miocene gas and oil-bearing deepwater sands deposited as fan complexes in an intraslope basin. The field has been proved up by a total of 12 well penetrations and is nearing the development stage. In an effort to predict reservoir performance and recovery efficiencies, 3D reservoir models were constructed using Exxon's in-house 3D modeling program (GEOSET). Reservoir simulation studies will be based upon these 3D geological models.

3D seismic data was used to map seismic attributes around the prospect and well control was used to calibrate the seismic attributes based on known reservoir characteristics and thereby derive a facies map for the entire field.

Top/base structure, gross isopach, facies polygons, porosity and Vshale were input into GEOSET to define the overall reservoir "container" and "fill". The paucity of well data was compensated for by using the 3D-seismic based facies as a guide to filling polygons and be creating "pseudowells" from the real well data. These pseudowells aided in the correlation within and between polygons.

The resulting 3D models (total porosity, effective porosity, Vsand) faithfully reflect the heterogeneity inferred from both 3D seismic data and well control and provide an excellent visualization of reservoir continuity - much better than models derived from well data alone. The models serve as a framework within which reservoir simulations can be performed and various sensitivities run. Additionally, the GEOSET porosity models can provide an alternative reservoir volume calculation.